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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* JEFFREY MORGAN ALDEN and DANIEL J. REAUME

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Appeal 2010-001298  
Application 09/740,584<sup>1</sup>  
Technology Center 2800

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Before JOSEPH F. RUGGIERO, MARC S. HOFF, and CARLA M.  
KRIVAK, *Administrative Patent Judges*.

HOFF, *Administrative Patent Judge*.

DECISION ON APPEAL<sup>2</sup>

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<sup>1</sup> The real party in interest is General Motors Corporation.

<sup>2</sup> The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, or filing a request for rehearing, as recited in 37 C.F.R. § 41.52, begins to run from the “MAIL DATE” (paper delivery mode) or the “NOTIFICATION DATE” (electronic delivery mode) shown on the PTOL-90A cover letter attached to this decision.

## STATEMENT OF CASE

Appellants appeal under 35 U.S.C. § 134(a) from a Non-Final Rejection of claims 1-19. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm-in-part.

Appellants' invention concerns a process for analyzing a sub-model of a full system model. Calculation entities in the sub-model that depend on entities in the full model that are outside the sub-model are converted to temporary data entities. Any data entity in the sub-model from which a converted temporary data entity depends is deleted. The process also determines if there are any isolated cycles in the sub-model, and if so, which of the entities in the isolated cycle will be an output entity. The process further adds all global variables to the sub-model that are used in the full model (Spec. 3-4).

Claim 1 is exemplary of the claims on appeal:

1. A method of analyzing a sub-model of a full system model, said system model representing a system, said method comprising the steps of:  
defining the sub-model as a collection of entities in a visual medium;  
determining which of the entities in the sub-model are calculation entities and which are data entities;  
converting the calculation entities in the sub-model that depend on entities in the full model that are not included in the sub-model into temporary data entities;  
identifying output entities in the sub-model, where the output entities are calculation entities that do not have an output to another entity; and  
visually analyzing changes in the sub-model in response to performing the calculations for the calculation entities, wherein visually analyzing changes in the sub-model includes analyzing changes in the size of at least one data entity.

The Examiner does not rely upon prior art in rejecting the claims on appeal.

Claims 1-19 stand rejected under 35 U.S.C. § 112, second paragraph, as failing to particularly point out and distinctly claim what Appellants consider to be their invention.

Claims 1-12 stand rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter.

Throughout this decision, we make reference to the Appeal Brief (“App. Br.,” filed July 8, 2008), the Reply Brief (“Reply Br.,” filed August 19, 2008) and the Examiner’s Answer (“Ans.,” mailed June 26, 2008) for their respective details.

## ISSUES

With respect to the § 112 rejection, Appellants argue that the Examiner erred in finding that several phrases in the claims on appeal lack antecedent basis or are otherwise indefinite (App. Br. 3-5).

With respect to the § 101 rejection, Appellants argue that the claims on appeal recite patent-eligible subject matter because the claims are tied to a particular machine or apparatus. According to Appellants, the presence of the claim limitations “defining the sub-model as a collection of entities in a visual medium” and “visually analyzing changes in the sub-model” mean that the claim is tied to a particular apparatus and cannot be performed mentally (Reply Br. 3-4).

Appellants’ contentions present us with the following issues:

1. Do Appellants’ claims recite language lacking antecedent basis?
2. Are Appellants’ claims indefinite under § 112, second paragraph?

3. Does Appellants' claimed invention satisfy the machine-or-transformation test described in *In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008) and is the claimed invention directed to an abstract idea?

### PRINCIPLES OF LAW

The test for definiteness under 35 U.S.C. § 112, second paragraph, is whether “those skilled in the art would understand what is claimed when the claim is read in light of the specification.” *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 806 F.2d 1565, 1576 (Fed. Cir. 1986) (citations omitted). Claims must “particularly point[] out and distinctly claim[] the subject matter which the applicant regards as his invention.” 35 U.S.C. § 112, ¶ 2. However, “[o]nly claims not amenable to construction or insolubly ambiguous are indefinite....A claim term is not indefinite just because it poses a difficult issue of claim construction.” *Star Scientific, Inc. v. R.J. Reynolds Tobacco Co.*, 537 F.3d 1357, 1371 (Fed. Cir. 2008) (internal citations and quotation marks omitted). “Thus, the definiteness of claim terms depends on whether those terms can be given any reasonable meaning.” *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1347 (Fed. Cir. 2005).

“‘[T]he failure to provide explicit antecedent basis for terms does not always render a claim indefinite.’ . . . [D]espite the absence of explicit antecedent basis, ‘[i]f the scope of a claim would be reasonably ascertainable by those skilled in the art, then the claim is not indefinite.’” *Energizer Holdings, Inc. v. Int’l Trade Comm’n*, 435 F.3d 1366, 1370-71 (Fed. Cir. 2006). Antecedent basis can also be implied. *Id.* (holding that the term “anode gel” implicitly provided antecedent basis for a “zinc anode” in the same claim).

The law in the area of patent-eligible subject matter for process claims has recently been clarified by the Supreme Court in *Bilski v. Kappos*, 130 S. Ct. 3218 (2010). The Court in *Bilski* confirmed that “[t]he Court’s precedents provide three specific exceptions to § 101’s broad patent-eligibility principles: ‘laws of nature, physical phenomena, and abstract ideas.’” *Bilski* 129 S. Ct. at 3225, (quoting *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980)).<sup>3</sup> As to the machine-or-transformation test, the Court held that “[t]his Court’s precedents establish that the machine-or-transformation test is a useful and important clue, an investigative tool, for determining whether some claimed inventions are processes under § 101” but “[t]he machine-or-transformation test is not the sole test for deciding whether an invention is a patent-eligible ‘process.’” *Id.* at 3227. The Court further held that the term “process,” as used in § 101, does not categorically exclude business methods. *Id.* at 3222.

## ANALYSIS

### REJECTION UNDER 35 U.S.C. § 112, SECOND PARAGRAPH

We are persuaded by Appellants’ arguments, and agree that the Examiner erred in finding that several claim phrases lack antecedent basis.

With respect to the phrase “entities in the full model” (claim 1, lines 6-7), the Examiner states that it is unclear whether “entities” refers to calculation entities or data entities (Ans. 7). It is clear from Appellants’ Specification that calculation entities may depend on either (other)

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<sup>3</sup> These three exceptions also apply to claims directed to machines and articles of manufacture.

calculation entities, or data entities, or both (Spec. 5). Appellant therefore need not limit the term “entities,” because the term may refer to either type.

With respect to “converting” (claim 1, line 6), the Examiner finds that it is unclear what “converting” occurs because calculation entities and data entities are both values (Ans. 4). The Examiner’s finding is erroneous because Appellants’ Specification makes clear that calculation entities are calculated based on other data and/or calculation entities, whereas data entities are numeric values (constants) provided as “inputs” (Spec. 5). “Converting” calculation entities to temporary data entities thus has a definite meaning, because the two types of entities are not equivalent.

We find that it was error for the Examiner to find the term “the calculations” (claim 1, lines 10-11) lacks proper antecedent basis. The claimed “calculation entities,” when read in light of the specification, inherently include calculations. Antecedent basis is thus implied. *See Energizer Holdings*, supra. For similar reasons, it was error to reject “the size” (claim 1, line 12) for lack of antecedent basis. A data entity, being a value, inherently has a magnitude or size.

We do not agree with the Examiner that “connecting arcs” in claim 2 lacks antecedent basis.<sup>4</sup> Appellants are presenting an original recitation of this property of the temporary data entities.

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<sup>4</sup> Appellants amended claim 2, by Preliminary Amendment filed February 6, 2001, to include the phrase “connecting arcs.” No subsequent amendment to claim 2 appears in the record. Notwithstanding the fact that the Claims Appendix of Appellants’ Brief presents the original version of claim 2 as appealed and that the Examiner states in the Answer that Appellants’ version of the claims in the Appendix is correct, it is clear from the record that the amended version of claim 2 is the version now pending. Appellants and the Footnote continued on next page.

Similarly, we do not agree with the Examiner that the phrases “isolated cycles” (claim 3) and “all global variables” (claim 7) lack antecedent basis, as Appellants are merely presenting an original recitation of properties of the sub-model.

Appellants have established that the Examiner erred in rejecting claims 1-19 under § 112, second paragraph, due to a lack of antecedent basis. Accordingly, we will not sustain the § 112 rejection of claims 1-19.

REJECTION UNDER 35 U.S.C. § 101

We select claim 1 as representative of this group of claims, pursuant to our authority under 37 C.F.R. § 41.37(c)(1)(vii).

The Examiner rejected claims 1-12 as directed to patent-ineligible subject matter, arguing that under *In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008), the claimed method must be (1) tied to a particular machine or apparatus or (2) transform a particular article to a different state or thing (Ans. 5). The Examiner concluded that the claimed invention failed this “machine-or-transformation” test because claims 1-12 are not tied to a particular machine or apparatus, but rather are a series of mental steps that can be performed without a machine or apparatus, and because such a series of mental steps likewise fails to transform any particular article to a different state or thing (Ans. 5-6).

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Examiner clearly believe that the amended version is pending, as well, because Appellants present argument traversing the Examiner’s rejection of claim 2 as lacking antecedent basis, and the Examiner’s rejection is based on language only present in the amended version. We will therefore treat the version of claim 2 presented in Appellants’ amendment of February 6, 2001, as the actual text of claim 2 pending and under appeal.



Appellants respond that “it just does not seem possible that a person could perform [the method steps of claims 1-12] mentally” (Reply Br. 3). Further, Appellants argue, the step of visually analyzing changes in the sub-model is a visual step that requires eyes (Reply Br. 4); the claimed invention requires defining the sub-model as a collection of entities in a visual medium (*Id.*); and said visual medium would be part of some type of machine or apparatus (*Id.*).

Subsequent to the Examiner’s Answer and Reply Brief, the Supreme Court held that while “[t]he machine-or-transformation test is not the sole test for deciding whether an invention is a patent-eligible ‘process.’” the machine-or-transformation test “is a useful and important clue, an investigative tool, for determining whether some claimed inventions are processes under § 101.” *Bilski v. Kappos*, 130 S. Ct. 3218, 3227 (2010).

We agree with the Examiner’s finding that claims 1-12 on appeal recite a process that does not satisfy the machine-or-transformation test. The claimed steps of defining the sub-model as a collection of entities, determining which entities are calculation entities and which are data entities, converting “dependent” calculation entities into temporary data entities, identifying output entities, and visually analyzing changes in the sub-model including analyzing changes in the size of at least one data entity are in no way tied to any particular machine or apparatus, and do not recite any transformation of any particular article to a different state or thing.

Further, we regard the invention recited in claim 1 to recite a patent-ineligible abstract idea. We agree with the Examiner that representative claim 1 recites a series of steps that may be performed mentally. We are not persuaded by Appellants’ argument that “defining the sub-model as a

collection of entities *in a visual medium*” affirmatively requires a visual medium, because the phrase “visual medium” is merely descriptive of abstract “entities” that are to be “defined,” the step of “defining” encompassing a mental process.

Contrary to Appellants’ argument (Reply Br. 4), we regard Appellants’ step of “visually analyzing changes in the sub-model” as insufficient to remove the claimed invention from the realm of mere abstract ideas. Appellants further limit this step as including “analyzing changes in the size of at least one data entity.” According to Appellants’ Specification, the claimed “analyzing changes” corresponds to determining whether a given entity’s value has increased or decreased due to the change in the new input. Appellants disclose, but do *not* affirmatively claim, visually representing the change in an entity’s value (Spec. 10). Because Appellants do not claim such visual representation, let alone any apparatus necessary to perform said visual representation, Appellants have not shown that the Examiner erred in concluding that representative claim 1 is directed to a patent-ineligible abstract idea.

Because Appellants have not persuaded us that the Examiner erred in concluding that claims 1-12 are directed to non-statutory subject matter, we will sustain the § 101 rejection of claims 1-12.

## CONCLUSIONS

1. Appellants’ claims do not recite language lacking antecedent basis.
2. Appellants’ claims are not indefinite under § 112, second paragraph.

3. Appellants' claimed invention does not satisfy the machine-or-transformation test described in *In re Bilski*, and is directed to an abstract idea.

ORDER

The Examiner's § 112 rejection of claims 1-19 is reversed. The Examiner's § 101 rejection of claims 1-12 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED-IN-PART

ELD

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